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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,171	06/21/2001	Yang-lim Choi	Q64026	4000

7590 06/17/2004

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EXAMINER

SAJOUS, WESNER

ART UNIT PAPER NUMBER

2676

DATE MAILED: 06/17/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/885,171

Applicant(s)

CHOI ET AL.

Examiner

Wesner Sajous

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-14, 20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-7, 10, 13, 14 and 20 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 11, 12 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6-7, 10.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### Remark

This communication is responsive to the amendment and response filed on April 5, 2004. Claims 1, and 15-19 are canceled, and claim 21 is added. Accordingly, claims 2-14, and 20-21 are now presented for examination.

### Response to Arguments

1. The Applicant, at pages 10-11 of the response, argues that the Nishida reference does not teach obtaining a first *list of straight lines by connecting pixels*, and that by relying upon the theory of inherency the Examiner has not provided the basis to reasonably support the determination that Nishida inherently teaches connecting pixels (as recited in claim 2).

The Examiner, in response, respectfully disagrees. At Nishida, it is provided that lines constituting skeletons are divided into a plurality of fragments or segments 0-18 that are combined or connected to form characters "3456"(as depicted in fig. 6). These connected segments or, for example, connected segments 3-7 (of character "4") corresponds to the list of straight lines. As for the basis for supporting the determination that Nishida inherently teaches connecting pixels, the Applicant is directed to col. 1, lines 54-66, which suggest that lines for splitting characters are formed of successively traced pixels and/or that pixels correspond to image contours that comprises connection of character strings (see col. 3, lines 20-30). Thus, since connected segments (or lines) 3-7 constitute a character and characters are known to comprising pixels, it would be

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apparent to those of artisan skilled in the art, in evaluating Nishida, that the lines divided to form the connected segments (or list of lines) are obtained by connecting pixels.

Therefore, the Applicant's arguments are not deemed persuasive.

With regard to the claim 3 argument presented by the Applicant-Nishida makes no mention regarding obtaining a height and a width first and then obtaining a skeleton from the obtained height and width, the Examiner does not found such an argument convincing, because there is no apparent reason in the claim of why the order to performing the process matters; i.e., why the height and width (e.g., the distance map) must first be detected prior to obtaining the skeleton. It is not believed that the reversal of orders of the steps performed would deviate from the scope of the invention, because in Nishida, like the claimed invention, the anticipated result is to extract a shape from a skeleton image (see col. 5, lines 40-45). Thus, the rejection is maintained. See below.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2-7, 10, 13-14 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishida (US Pat. 5497432).

Considering claim 2, Nishida discloses a shape descriptor extracting method (fig. 1) comprising: extracting (via S121) a skeleton (see fig. 4) from an input image (S100,

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see also fig. 3); obtaining (via item 30 of fig. 2) a first list of straight lines (i.e., lines 0-18, see fig. 6) by [inherently] connecting pixels based on the extracted skeleton (of, i.e., fig. 4); and determining (via item 30 of fig. 2) a second list of straight lines [inherent in fig. 15] by normalizing (e.g., via the algorithms depicted at figs. 7-14), the first list of straight lines (fig. 6) as a shape descriptor. See col. 4, items 1-30, col. 5, lines 40-43, and col. 6, line 2 through col. 12, line 18, wherein the normalization step is performed by the minimum and maximum line segment coordinates calculation using the parameters depicted at figs. 7, 11 and 13.

Re claim 3, Nishida discloses obtaining a distance map by performing a distance transform on the input image; and extracting a skeleton from the distance map. See col. 5, lines 40-60, wherein the distance map is characterized by the calculated height and weight of the character string.

As per claim 4, Nishida discloses thinning the extracted skeleton; and extracting straight lines by connecting respective pixels within the thinned skeleton (as performed by steps 121-125 of fig. 1, see also figs. 5-6).

Re claim 5, Nishida discloses making a list of starting point and ending points of the connected lines (see fig. 7, wherein Nos. 0-18 correspond to the lines, and the min and max coordinates associated with the lengths correspond with the distance between end points of the lines). In addition, Nishida discloses a first list of straight lines (i.e., lines 0-18, see fig. 6) by a straight lines combination of the extracted lines (see figs. 5-6); and determining a second list of straight lines [inherent in fig. 15], obtained by normalizing (e.g., via the algorithms depicted at figs. 7-14), the first list of straight lines

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(fig. 6) based on the maximum distance between ending points of respective lines as a shape descriptor. See col. 7, lines 10-45 and col. 8, line 53 to col. 10, line 10.

Re claim 6, Nishida [inherently] discloses (via fig. 7) the equivalence for a distance transform based on a function indicating respective points within an object with the minimum distance value of the corresponding point from [a] background. See col. 6, line 2 through col. 12, line 18.

As per claim 7, Nishida the equivalence for discloses obtaining a local maximum (Xmax) from the distance map (i.e., LENGTH associated with the max and min coordinates, see fig. 7) using an edge detecting method (as characterized by the disclosure at col. 9, lines 18-35.

Regarding claim 10, Nishida discloses the input image is a binary image. See cols. 4-5, line 65-3.

As per claim 13, Nishida discloses the equivalence for performing a straight-line combination (see figs 8-10) by [inherently] changing threshold values of an angle between the straight lines, a distance and a length of a straight line (as depicted in figs. 8-10) from the obtained first list of straight lines (as depicted in fig. 6). Note that each of the lines depicted in figs. 8-10 for the combination of characters includes a length and distance associated with the lines of fig. 6, and to combine the pieces of lines together, a threshold value associated with the lines must be calculated, so as to make a valid connection between the lines to result to a complete character.

As per claim 14, the claimed "repeating the straight line combination until the number of remaining straight lines becomes equal to or less than a predetermined

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number" is inherently performed in Nishida, because in Nishida all the pieces of lines (i.e., lines 8-8 to 8-12) associated with a character (i.e., character 5) must be accounted for in the min and max coordinates calculation before the desired outcome is achieved.

As per claim 20, Nishida discloses obtaining a map of the input image (see fig. 3); and extracting a skeleton (see fig. 4) from the obtained map.

#### ***Allowable Subject Matter***

4. Claims 8-9, 11-12 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because the prior art of record fail to teach or suggest a shape descriptor extracting method comprises the step of performing a convolution using a local maximum detecting mask of four directions to obtain a local maximum (in re claim 8); recording a label corresponding to a direction having the greatest size on a direction map and a magnitude map (as recited in claim 9); and leaving a pixel having the greatest size in a direction rotated by 90 degree from the corresponding direction on the direction map, and removing the rest of the pixels (as recited in claim 11). The prior art of record fail to teach that the connected pixels having a same level on direction maps of a plurality of directions to obtain the first list of straight lines (as recited in claim 21).

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### **Conclusion**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

**Any response to this action should be mailed to:**

**Box**

Commissioner of Patents and Trademarks

Washington, DC 20231

**Or faxed to:**

(703) 308-9051, (for formal communications; please mark "EXPEDITED  
PROCEDURE")

**Or:**

(703) 872-9314 (**for technology center 2600 only**)

Hand-held delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, 6th floor (receptionist).



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesner Sajous whose telephone number is (703) 308-5857. The examiner can be reached on Mondays thru Thursdays and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (703) 308-6829. The fax phone number for this group is (703) 308-6606.

*Wesner Sajous - WPS*

*6/4/2004*

*Matthew C. Bella*

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